PROGRESS OF THE ARTIFICIAL LIMB PROGRAM

HEARING

BEFORE THE

COMMITTEE ON LABOR AND PUBLIC WELFARE UNITED STATES SENATE

EIGHTY-FIFTH CONGRESS

FIRST SESSION

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DEPOSITED BY THE
UNITED STATES OF AMERICA

PROGRESS OF THE ARTIFICIAL LIMB PROGRAM

FRIDAY, MAY 24, 1957

UNITED STATES SENATE,
COMMITTEE ON LABOR AND PUBLIC WELFARE,
Washington, D. C.

The committee met at 10:30 a. m., pursuant to notice, in the old Supreme Court room, the Capitol, Senator Lister Hill (chairman of the committee) presiding.

Present: Senators Hill, McNamara, Thurmond, Purtell, and Cooper.

Present also: Senator Charles E. Potter and Congresswoman Edith Nourse Rogers, of Massachusetts.

Committee staff present: Stewart E. McClure, chief clerk, and John S. Forsythe, general counsel to the committee.

Chairman HILL. The committee will please be in order.

This special meeting has been called for the purpose of hearing the Chairman of the Prosthetics Research Board, National Academy of Sciences, and representatives from the medical and prosthetics professions explain the progress of the artificial limb program to date. A group of amputees is present to demonstrate to the committee and its guests the latest devices and techniques now available to amputees throughout the country.

For those who may not be familiar with the background of this program, may I point out that it was initiated in 1945 by the late Secretary of War, Robert Patterson. The program is supervised by the Prosthetics Research Board of the National Academy of Sciences. Fiscal responsibility for contractual research was assumed in 1946 by the Veterans' Administration, using medical research funds.

Congress recognized the necessity for continuity in a research program of this type and on June 19, 1948, enacted Public Law 729, 80th Congress, which authorizes the appropriation of up to $1 million annually to the Veterans' Administration for prosthetics research, including all forms of prosthetic and orthopedic appliances and sensory devices.

Prosthetics clinic teams are taught the results of this research program at schools whose operation is made possible by Public Law 565, 83d Congress. This law amended the Vocational Rehabilitation Act to permit the Department of Health, Education, and Welfare to make—

> grants to States and to public and other nonprofit organizations and agencies * * * to assist in meeting the costs of projects for research, demonstrations, training, and traineeships, and special projects, which hold promise of making a substantial contribution to the solution of vocational rehabilitation problems common to a number of States.

During the past 12 years, the artificial limb program has accomplished striking results, the benefits of which accrue equally to civilian amputees and to veterans.

A demonstration similar to the one we are to see here today was given before the House Committee on Veterans' Affairs some 3 years ago. And may I say how happy we are to have with us here today Congresswoman Rogers of Massachusetts, formerly chairman of the House Committee on Veterans' Affairs.

This is the first time, however, that the results of research in the artificial limb field have been presented before a Senate committee.

This is also the first time that any devices available for children will be demonstrated on Capitol Hill.

If there is any single man who is preeminently responsible for the splendid results of prosthetics research and development, it is Gen. F. S. Strong, Jr., Chairman of the Prosthetics Research Board. It is now my pleasure to introduce to you General Strong, who will present the artificial limbs demonstration.

STATEMENT OF BRIG. GEN. F. S. STRONG, JR., CHAIRMAN OF THE PROSTHETICS RESEARCH BOARD, NATIONAL ACADEMY OF SCIENCES AND NATIONAL RESEARCH COUNCIL

General STRONG. Senator Hill and members of the committee and Congressman Rogers and ladies and gentlemen, the people who are making this possible appreciate more than we can tell you this opportunity to show what has been done over a period of years to help our handicapped people. I think, Senator, you have outlined very well how the program came into being and how it was continued and I also wish to say that without Mrs. Rogers' wisdom at the critical time in providing for continuity, many of these research projects would have had to fold up.

The matter of continuity, I am sure you will appreciate, is very important because the researchers in this field must carry on their work over the years and if they feel that they have only a short tenure they cannot accomplish what they hope to.

There is one other point about the children. This is the first time that we have had them here, but we have been interested in them for a good many years. I think this was first brought to our attention, and I speak of those in the artificial limb program started by the armed services and the Veterans' Administration, through the interest of Dr. Dean and the members of the Michigan Crippled Children Commission who came to us and asked if there was any way that we could help them, too.

We have tried to help and through scaled-down appliances, and through coordination, I think you can see the results here are coming along, also.

The Children's Bureau of the Department of Health, Education, and Welfare are very much interested in this, and are supporting the program also.

I think we can start. Dr. Sidney Fishman of New York University and his helpers, with the assistance of Mr. McClure who has been most cooperative and understanding, have prepared a program which will give a general idea of the scope of the work being supported by the Congress. I am going to call first on one of our well-known orthopedic surgeons who has been working on this program a great many years and who will show in principle the operation of what is known as the prosthetic clinic team.

This team was developed first in the Veterans' Administration in their regional offices. They finally established 30 of these regional

clinic teams in which the doctor, the therapist, and the prosthetist, or limb fitter, worked together with the amputee to make up a prescription for his rehabilitation.

I will now call upon Dr. Bechtol of Yale University Medical School, who will discuss upper extremity prosthetics.

STATEMENT OF DR. CHARLES O. BECHTOL, ASSOCIATE PROFESSOR OF ORTHOPEDIC SURGERY, YALE UNIVERSITY

Chairman HILL. We are happy to have you with us and you may proceed in your own way, sir.

Dr. BECHTOL. Mr. Chairman and gentlemen of the committee and Mrs. Rogers, we would like to show you the complex problem that the replacement of the upper extremity represents and show you the various types of devices which are available for this. We would also like to show you why it takes a team to carry this out.

I, as a physician, do not know enough about how to manufacture an artificial limb and how to train the patient in its use to carry this out myself. The therapist understands her particular field, but does not know how to carry out the surgical part of it, and the artificial limb maker likewise is skilled in his manufacture of limbs, but cannot carry out the training and the operations necessary.

The clinic team represented today is Lieutenant McDonnell from Walter Reed Hospital and Mr. Hitchcock from the New York University research project.

Here, in Private Northrup, you see our most severe problem in replacing an arm. This man has lost his entire arm, so that we must replace all of the parts. We have a terminal device, in this case an Army Prosthetics Research Laboratory hook, and there is a device which allows this hook to be turned from side to side so that he can put it in whatever position he would like.

There is an elbow device which allows him to move the elbow. For this particular problem we have found it best not to attempt to put in shoulder motion.

I would like to have Lieutenant McDonnell now demonstrate some of the training motions that she goes through as this man carries out motions with this elbow. By use of the control cable in back he carries out these motions and there is a lock cable in front which also allows these to be carried out.

This requires in this particular case many hours of training, to gain the necessary skill to be able to operate this with ease.

I wonder if you would remove your prosthesis for us.

This is designed so that he can easily remove it and he does not require any help or anyone to get him into his arm. This whole arm is extremely light and I am going to ask Mr. Hitchcock now to explain to you some of the factors which allow us to fit this difficult type of amputation.

STATEMENT OF WILLIAM E. HITCHCOCK, PROSTHETICS INSTRUCTOR, POSTGRADUATE MEDICAL SCHOOL, NEW YORK UNIVERSITY

Mr. HITCHCOCK. This particular device has a rather large shoulder cap which fits over the amputee's extremity. By use of this cap, we

are able to utilize whatever remaining shoulder motion is present in order to operate the various functions of the device.

Chairman HILL. May I ask one question? How did you lose your arm?

Lieutenant MCDONNELL. An automobile accident, sir.

Dr. BECHTOL. This man is still a patient at Walter Reed Hospital.

(A new case came in.)

Dr. BECHTOL. This next case represents an excellent example of rehabilitation, and this is Sergeant Spencer, who is back on active duty with the Army, and he works at the Army Prosthetic Research Laboratory with the duplicating machines and has to handle either individual sheets of paper or large packages of paper and run these rather complex machines which he does very skillfully with his prosthesis.

This certainly represents an excellent example of rehabilitation. His operation was in 1950, and he has had a special second operation by which we are able to fasten the muscles of his upper arm to his artificial limb. This gives him the advantage of not having a harness over the other side of his body, so that he has the comfort that that allows, and it also gives him the advantage of being able to operate in many different positions.

He can open his hook in the position in which his arm now is, and he can also do that behind his head and behind his back and at the extreme reach out to the side. These are things which would be extremely difficult or impossible to do if he were hooked up with the ordinary type of harness.

So we present to you Sergeant Spencer as an example of really successful rehabilitation, back on active duty with the Army.

Thank you.

One of our problems in the field of rehabilitation in the upper extremity is the extreme difficulty in the needs of the various men. I think these two gentlemen whom we now have here, Mr. Dennehy and Mr. Rice show this difference in needs to an extreme degree.

Mr. Dennehy, what is your profession?

Mr. DENNEHY. I am a contract administrator under personnel.

Dr. BECHTOL. That means you are meeting the public all of the time; is that correct?

Here is a man who meets the public and he is in personnel work and what he wants is something which is cosmetically as excellent as he can get. He still needs some function from this device, and so that he is wearing the APRL voluntary closing hand with cosmetic glove.

As you can see, the hand is a functional hand, and at the same time it allows him to appear in public without attracting the attention that a hook would, and if you noticed him walking in, his arm swings quite naturally as he walks because the shoulder and the elbow are coupled together, so that they function.

Mr. Rice represents, I think, the opposite extreme.

What is your occupation, Mr. Rice?

Mr. RICE. Mechanical engineering research.

Dr. BECHTOL. What sort of work does this involve during the day? Do you make devices or what do you do?

Mr. RICE. We design and build all sorts of small intricate affairs, and each of us is given a certain phase of the project and it requires

actually holding very small pieces in my hook without which I don't think that I would be able to do the job.

Dr. BECHTOL. I understand that Mr. Rice lives on a farm and in his spare time and over weekends he actually carries out farmwork and we would like to point out the excellent design of this hook, so that as he has just told you he is able to do small and intricate assembly work during the day, and when he goes home he uses another portion of this hook to hold a shovel handle and he is able to carry out heavy farmwork without having to change his equipment.

This has been one of the big goals of our program. To develop something that does not require the amputee to carry a lot of spare parts around in a suitcase.

There is one other thing I would like to show you about this terminal device and that is the fact that he can use any selective force or grasp which he wishes.

He can take this paper cup and hold it so lightly that you see the cup is not crushed and I can easily remove it. He can also take the cup and squeeze it very tightly so that it is crushed flat and I can't get it out. It is very firmly held there so that we have given him back one other function of his hand. That is the ability to grasp something either with a very light grasp or with a very heavy grasp, as is necessary.

I would like to have Mr. Hitchcock, our limb fitter, come up and explain the intricacies of this elbow-locking device which is another product of the research program.

Mr. HITCHCOCK. This amputee has three rather distinct control systems in his device, the first of which is a control cable passing from the harness down to the forearm. This enables him to flex or bend the forearm.

Another control system operates the hook or hand.

A third system alternately locks and unlocks the elbow. This particular elbow joint, this outside locking joint, permits us to build a prosthesis so that the elbow lengths will be just about the same, where earlier devices would preclude the use of this technique.

Dr. BECHTOL. Thank you.

In summary, gentlemen, we would like to emphasize two points: The research program has developed these various types of helpful aids for the amputee. All of the things you have seen are no longer experimental, and they are actually produced models available to any amputee in the country.

Then, I think one of the greatest steps that this program has taken is to put on schools for doctors, physical therapists, and limb-fitters all over the country so that rather than wait for 10 years for this material to filter out through the medical journals and so forth, it is now available for all of these amputees at the present time.

Eighty-five separate clinic teams have been trained. They are in 50 of the major cities over the country, so that any amputee in any part of this country can now gain the benefit of all of this research without, as I say, having to wait a number of years until it is ready.

Senator THURMOND. I would like to ask one question. How do you prevent irritation of that muscle?

Dr. BECHTOL. It is a matter of just simple skin care, using non-irritating soap. You care for the skin inside that tunnel the same as you care for it anywhere. It has not been a problem.

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There has been a followup study on that type of operation, and the results have indicated a very high degree of success.

Senator THURMOND. Of course you had to graft skin inside?

Dr. BECHTOL. I won't go into the details of it, but there is a tube of skin placed through the muscle, so that it is his own skin.

Chairman HILL. If there are no further questions, we certainly want to thank you.

General STRONG. I just glanced over here and I see Sergeant Spencer has changed his hook to a hand. This is one of the things that can be done, because sometimes in working a man wants to use the hook in the daytime and he wants to go out in the evening with a hand.

It is a very quick interchange that has been made. Sergeant Spencer did it while he was sitting over there. He could do it here in about 30 seconds, but we won't show those little tricks.

Thank you, Sergeant.

Chairman HILL. Thank you, Doctor.

General STRONG. The next will be in the area of lower extremity prosthetics, and for this we are asking Dr. Cameron Hall of the University of California, Los Angeles, to demonstrate a few of these cases.

STATEMENT OF DR. CAMERON B. HALL, CLINICAL PROFESSOR, DEPARTMENT OF SURGERY (ORTHOPEDICS), SCHOOL OF MEDICINE, UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Chairman HILL. We are very happy to have you here, sir, and we would be glad to have you proceed in your own way.

Dr. HALL. Thank you very much.

As with the upper extremity amputee, the clinic team is the most important function that we have to offer. Of the clinic team, the most important member is the patient. Mr. McCarthy suffered the loss of his lower leg in action in Germany in December of 1944 and he was fitted with a conventional lower extremity prosthesis, consisting of a pelvic belt, a thigh lacer, and a shin, and an ankle unit.

Now, of interest in that foot and ankle, he is wearing what is called a Sach foot, solid ankle, cushion heel. The Sach foot is the result of the experimental work done at the University of California, at Berkeley, and differs from the conventional foot in that, as in the little model in my hand here, we have a bolt that goes through the ankle in the conventional foot and the foot goes up and down much as my foot does on its ankle.

Certain difficulties were found in the design and construction and the wearing of this device. Through the research of the University of California a device was developed which entails no ankle joint, a solid ankle of wood or metal and a heel which may be made of various types of compressible material, plastic, rubber, which allow compression rather than motion, so that normal function is represented.

Now, I would like Mr. Hennessy, our prosthetist, to tell us a little about the advantages of the Sach foot as far as the prosthetic industry is concerned.

STATEMENT OF MR. CHARLES HENNESSY, PROSTHETICS INSTRUCTOR, SCHOOL OF MEDICINE, UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Mr. HENNESSY. I would like to point out that the Sach foot by the mere fact that it has eliminated this metal ankle joint is an energy-saving component of the prosthesis for the amputee.

Although it is a solid ankle, by the compression of the back of the foot here, the black rubber, a normal-like action is provided in transmitting the forces to the ball of the foot during walking.

The construction is now simplified to the point that any prothetist can take the specifications, construct the foot, and apply it to any one of the existing devices.

Dr. HALL. I would like to have one of the third and most important members of our clinic team, Miss Waters, demonstrate the function of the Sach foot on Mr. McCarthy.

Miss WATERS. The training problems when the Sach foot is used are materially less than when other feet are used because the Sach foot allows motion in many of the directions that other kinds of ankles do not allow.

For instance, you have this motion here, and you have motion on the inside and the outside which will take care of going over rougher terrain. Aside from that, the Sach foot provides more comfort for the stump. This heel absorbs much of the shock; thereby lessening that which the stump must absorb.

Dr. HALL. So in retrospect, we have an experimental device which allows the amputee more comfort, greater energy, and it is simpler to manufacture. In general it has proven much more useful.

Now, in the upper extremity amputees, demonstrated by Dr. Bechtol, as well as in Mr. McCarthy, we have shown devices held on by straps, buckles, and various retaining gadgets.

Mr. Kramer suffered the loss of his leg above the knee in action in Germany in 1944 and he is wearing a rather bizarre looking device which consists of a plastic socket and an adjustable leg. The plastic socket is for teaching and research purposes while the adjustable leg is for actual use by the prosthetist in fitting an amputee.

Now, the finished product looks like this child's leg that I am demonstrating. As you notice, he has no retaining holding, or buckle devices whatever. His leg is simply in a socket-shaped in this rather bizarre fashion in a more or less square shape.

We have a round peg in a square hole, which is fashioned to conform to certain muscular requirements. He has the ability to hold that leg against inordinate pressures, and I would like Miss Waters to demonstrate Mr. Kramer's ability to hold this leg. Suction alone is doing it.

Miss WATERS. I am going to apply pressure downward and also in a rotation motion.

Dr. HALL. There are no belts, no straps, or other devices.

Chairman HILL. How heavy would that leg be?

Dr. HALL. Probably you can derive that just from handling this model; that is a child's leg. It weighs probably not over 6 to 8 pounds in its finished state.

Mrs. ROGERS. How many years have you demonstrated?

Mr. KRAMER. Quite a few.

Dr. HALL. Now, Mr. Kramer has this adjustable leg that the prosthetists use. No matter what the skill of the prosthetist he must sometimes make adjustment. To fabricate a leg of this type and adjust it, means cutting and changing and finishing. By use of the adjustable leg, again developed at the University of California, we can take an amputee and take his basic measurements and apply the leg, then change it as necessary before the finished leg is duplicated.

I would like Mr. Hennessy to demonstrate what is done to correct the obvious lack of correct alinement in Mr. Kramer's case.

Now, first of all I would like Mr. Kramer to walk back and forth and you can see he has rather a marked limp and the leg seems to be a little short and certainly, he is obviously knock kneed. There is a rather awkward action of the foot that goes out and around much different from the normal side.

We will ask Mr. Hennessy to correct that.

(Mr. Hennessy made some adjustments in the leg.)

Dr. HALL. Compared to the cutting and glueing and painting of a finished leg, this is a rather simple procedure. Mr. Hennessy has corrected the length, and now by a few simple adjustments he will correct the knock-kneed motion.

This leg is then placed on another device developed in the experimental program, the alinement duplication jig, which is simply a device in which the adjustable leg can be placed and the alinement can be duplicated in the finished product.

Now, would you walk again?

Now, obviously, we have an improved gait, but he still does not look very good. He has a rather marked side sway, and this is where the other member of our team comes in.

Miss Waters, would you demonstrate the problem of the therapist in now correcting the gait of a properly alined and fitted amputee.

Miss WATERS. In the training of the amputee, we have two problems. No. 1, we must teach this amputee to walk on level ground and then we must teach him to do the activities that you and I take for granted, such as sitting in a chair or going down the steps.

But we will just take this one problem that was presented and that is shifting of the trunk to one side.

Now, one of the techniques that may be used to correct this type of gait would be to have the amputee place his hand over the other side of his head so that it will bring his body in a straighter position and have him practice this a number of times, with constant supervision and correction. Then the arm is gradually brought down to the side, hoping that eventually he will have a normal gait pattern.

Dr. HALL. Thank you very much.

We have then shown 2 types of lower extremity amputees, 1 with the loss above the knee and the other with the loss below the knee. Both of these have been immeasurably helped by the experimental and educational program.

Are there any questions?

Chairman HILL. Are there any questions?

Senator COOPER. Do these appliances cause much fatigue to the wearer?

Dr. HALL. That is an interesting question and work is now going on at the University of California to determine the amount of energy consumption of a person who has lost his foot or his ankle or his knee.

It appears that he uses about 2½ times as much energy in his normal walking as the well-constructed, normal individual does.

Mrs. ROGERS. Is it not true that the amputee always has pain?

Dr. HALL. I think within certain reservations; yes.

Mrs. ROGERS. They deserve an enormous amount of credit.

Dr. HALL. They certainly do.

Chairman HILL. Thank you very much, Dr. Hall.

General STRONG. We will now come to the children.

We are very much interested in the problems of the child amputee, and not only in the prosthetics problems, but all of the others that go with it. Recently a project has been established at the University of California at Los Angeles in some of the fundamental studies along this line.

However, from the practical standpoint, the Michigan people have done a great deal of work, and we have asked Dr. Aitken from the Mary Free Bed Clinic in Grand Rapids, the crippled children commission, to demonstrate four children.

STATEMENT OF DR. GEORGE T. AITKEN, CONSULTING ORTHOPEDIST, MICHIGAN CRIPPLED CHILDREN COMMISSION

Chairman HILL. We welcome you and we are happy to have you proceed in your own way.

Dr. AITKEN. Mr. Chairman and ladies and gentlemen, in presenting these children this morning I would like to point out that the use of a team is as important in children as it is in adults. By the nature of children we cannot demonstrate the use of the team as readily as we can with adults. But our therapist, who teaches them how to use their limbs, and the prosthetists who make it and, of course, the educators in addition are very important in the care of children.

I think also as a matter of introduction we should state that many of the advances that have been made in the care of children have been the direct result of the program that has already been presented to you, because in most instances the components that we utilize, and the techniques and the actual materials that we use in the fabrication of the limbs are things that have come directly out of this program.

May I show you the first patient.

This is David Dodge from Maryland. David is 6½ years old and he has a congenital. By that I mean he was born with an absence of a portion of his right forearm and a complete absence of his hand on the right side. This is the most common of all the so-called congenital—or those things present at birth—amputations.

This is not a surgical amputation. He has been fitted with a plastic laminated socket and he has a single cable control system and he has a scaled-down hand that is made of aluminum to conserve weight and it has rubber liners so he gets a good grip on the thing.

Can you open your hook for us?

Can you put your arm straight out and now open the hook. And now, can you put it away up over your head and now open it?

Would you turn around and put it behind your back and now open it?

This boy has been wearing a limb such as this since he was 2½ years of age. He has learned a two-handed functional pattern, and since by virtue of the congenital absence he never did have any remembrance of a two-handed pattern, this has been an acquired skill.

This makes it very necessary for our therapist to teach these children to establish a two-handed functional pattern in their practice.

This is Diana Beckett. Diana is 4½ years of age and she is from Maryland. Diana, unfortunately, had an injury when she was 22 months of age, and as a result of that injury she lost a portion of the left forearm and the hand.

Initially Diana was fitted with an arm similar to this, but her terminal device was this small mitten. At this age, children have no individualized finger grasp and it is a bilateral gross prehension. A mitten such as this is very helpful and yet it gives them some degree of cosmetic restoration.

As Diana grew older and she wanted a hand, she has been fitted with a cosmetic replacement similar to the gentlemen that Dr. Bechtol showed. She preferred the appearances to the function. The development of such hands has also come out of the program that we are all interested in.

Diana's mother tells me that when she tears this hand she wants a band-aid put on it.

This is Donna DeYoung from Michigan and Donna is 6½ years old and I have known her since she was 2 months of age. This young lady was born with a complete absence of both legs from the knee down and this again, is a congenital or present-at-birth type of amputation.

She was fitted at an age when she began to develop a-desire to do erect standing. It is very difficult to train a child like this because she has no sense of where her feet are and she has to use visual clues to establish that.

When she was first fitted with limbs she was raised up a considerable number of inches off the ground so it was like learning to walk with stilts. It took a long time to accomplish it, but it did work.

Would you walk for us now?

Initially she was fitted with knees that were rigid and gradually as they began to develop an ability to stand and walk, the knees were unlocked, first one and then the other.

Now, the interesting thing here is that this young lady has the advantages of another program which is a suction socket. She does not have to wear thigh harnesses, and she has no difficulty getting around.

So here again is a scaled-down component of an adult device that was developed within the program.

Our last patient is Eugene Sanchez-Saavedra. He is from New York. He again represents still another example of what can be done in the realm of children's prosthetics. We have shown you a young lady who had a loss of an extremity as a result of a surgical procedure, following an injury. We have shown you two children who were born with an amputation.

This young man was born with not an amputation, but was born with an abnormality of his left upper extremity which we will demonstrate in a moment. He is treated as an amputee without being truly an amputee. He is wearing a device that is made of plastic laminates and he has the usual small harness and he is wearing a hand which gives some cosmetic restoration and has simply a moveable thumb.

This is not as functional a device as many, but for reasons in this particular case it was selected. When he is standing this way, his

arms seem to be the same length. Now, this boy by virtue of the fact that he has an artificial elbow joint, must be able to lock it in areas.

This is a scaled-down elbow locking mechanism similar to the one that you saw in the adult. It is placed on the outside rather than the inside in order that this arm be not too long as compared to the opposite one.

Now, we will ask him to slip it off.

This is a congenital abnormality of the arm, treated as an amputee. We have given him functional restoration by means of a prosthesis, which is entirely more satisfactory than any surgical procedures that have been developed for this type of procedure.

I would like in closing to say that children with congenital amputations and abnormalities of their extremities can be very successfully treated as amputees, and their rehabilitation potential is much greater than the severe polio and many of the cerebral palsies. We think this is a very substantial contribution to the care of crippled children.

Chairman HILL. Thank you very much, Doctor.

General STRONG. One of the problems and perhaps the most important problem is the matter of dissemination of information and training of people who are responsible for the handicapped in how to obtain and use these new devices. Without that, we would have perhaps a series of reports, some models, and so on.

Senator Hill, you mentioned the Rehabilitation Act which we consider vital in the matter of getting these things to the civilian population. Mrs. Rogers was careful to put in that act that the Veterans' Administrator is authorized to get this information, but how to do it is a problem.

I am so happy that Miss Mary Switzer, the Director of the Office of Vocational Education of the Office of Health, Education, and Welfare, is here. It is because of her cooperation—and you remember we talked about this a year or so ago—and through your cooperation, Senator Hill, and that of this Congress that we are able to start teaching people what can be done.

STATEMENT OF MISS MARY SWITZER, DIRECTOR, DIVISION OF VOCATIONAL REHABILITATION, DEPARTMENT OF HEALTH EDUCATION, AND WELFARE

Miss SWITZER. Mr. Chairman, it is always a great pleasure for me and all of us in the Department to have an opportunity to participate in anything sponsored by your committee, and it is a double joy to have Mrs. Rogers here this morning.

It must give her tremendous satisfaction to see how the dream she had many years ago is fanning out all over the country.

Your committee is proud, I know, to be able to have had not only a part in developing the legislation, but in sponsoring it through and supporting it where it matters—with appropriations to get the job done.

We feel that our major responsibility in relation to this program is to make available in every small town and hamlet in the country the results of the research you have seen here this morning. As a matter of fact, we have gone——

Chairman HILL. Will you excuse me one moment?

I notice our colleague, Senator Potter, has come in and we are delighted to have him here and we hope that he will come up here and take a seat.

Miss SWITZER. As long as we have broken to present Senator Potter, I would like to take the liberty of introducing to your committee a young member of our staff, who has two arm hooks, and who is so efficient and so effective in his use of them and much of what he has been able to do is also related directly to this program.

That is Bob Jones, and some of you have met him, and I would like to have you see really an effective amputee.

Our national program as you know has almost doubled in size since 1954 and one of the important areas that we are constantly concerned with is the more efficient fitting of the prosthetic devices, both upper and lower.

Last year out of our nearly 67,000 rehabilitants, there were six or seven thousand people who were fitted in one way or another with artificial appliances. There was about $2½ million of joint funds spent for this purpose.

I think that the training program which was started last year both at California and New York, has been immensely vital in spreading this information, because it is very important for the teams that you saw demonstrated with Dr. Bechtol and Dr. Hall to get down into the towns and hamlets of this country where the people are that need the services.

We have as an example of how one State does it, this morning, the representatives of the rehabilitation program from Georgia. Before I present them to you, I would like to tell you another incident that came to mind while Dr. Hall was talking, to illustrate the interplay of these two programs and what you might think was quite a farfetched field.

We have, as you know, an advisory council which recommends research grants. One of the projects which we will be supporting is in connection with this energy-measuring project at the University of California, where we are using the basic information and personnel that is working in the project on the measurement of energy by the loss of limbs in connection with the cardiac program.

Here we tie together fundamental research in what appears to be two unrelated areas, but where the knowledge gained will benefit in the rehabilitation of both of these groups of people.

I think this is an interesting interrelationship and a utilization of common facilities and what is even more important, talent.

Now, in our Georgia rehabilitation program, we have one of the leaders in the Nation in all fields in terms of numbers of rehabilitation. Georgia has led the country for 2 years. In the different kind of cases which the State has served, there has been also very imaginative and aggressive leadership.

I would like to give you an overview of the Georgia rehabilitation program to tell you exactly how a State public program in vocational rehabilitation has taken advantage of this very thrilling demonstration that you have seen here this morning.

Mr. Segars has overall charge for Georgia of the physical restoration part of his program. He has some interesting facts to present to you.

You will observe that he, too, is a rehabilitant in the prosthetic area.

STATEMENT OF JAMES J. SEGARS, SUPERVISOR, PHYSICAL RESTORATION, STATE DEPARTMENT OF EDUCATION, ATLANTA, GA.

Chairman HILL. We are glad to have you here, Mr. Segars.

Mr. SEGARS. We in Georgia have been providing artificial appliances for amputees for a long number of years, and several years ago we took a look at our program and were dissatisfied with the results. We found that we had purchased expensive appliances for some of our clients and even though they wore them home, when we went to see them, some of them were in the closet and didn't show much signs of wear.

We also found that some of our leg amputees particularly had terrible gaits and did not walk very well. Other limbs wore out because apparently they did not know how to take care of them.

So we contacted some of the medical profession and cooperated with them in establishing two amputee clinics in Georgia. We attempt to contact amputees just as soon as possible. We know that they do have a permanent disability and the sooner that we can talk with them, we think the better it will be.

We try to tell them something about the research program, about the types of appliances, and assure them that we are going to provide them with the very best artificial limbs that can be secured to meet their individual needs.

If we can get that story over to them, it generally makes the whole rehabilitation process a great deal easier.

It is a policy of the Georgia Division of the Rehabilitation Division to refer all amputees and amputees who have had any difficulty wearing prosthesis to an amputee clinic. We have two such clinics at the present time in that State. These cases are screened before being referred to an amputee clinic.

At the time they are referred, it is thought that there is a reasonable possibility that they can wear a prosthesis and can be rehabilitated in remunerative employment. All medical information on the case and some social and employment history is sent to the physiatrist prior to the client's arrival. In the initial visit, the client is seen by a team composed of the physiatrist, physical therapist, prosthetist, and vocational rehabilitation counsel.

The team discusses the type of prosthesis best suited to the client's needs and the prescription is written by the doctor. After delivery of the prosthesis the client is given training in the use and care of the prosthesis as prescribed by the physiatrist.

On completion of this training and the use of the prosthesis, the client may go directly into employment, or he may go to a vocational school for training. All cases are followed by the counselor in charge of the case until he is certain that the person is suitably employed.

Most cases are closed a few months after they have become employed and, naturally their wages in the beginning are not as high as they are later.

I recently did a little survey on the amputees that have been referred to Dr. Harriet E. Gillette's clinic in Atlanta, and found that during the last 5 years we have referred 565 amputees to this clinic for an evaluation.

Of these 565, 550 were accepted and the actual rehabilitation services initiated. Of these 550, 449 were males and 101 were females. There were about twice as many leg amputees as there were arm amputees and of the 550, 25 were bilateral amputees. Of these 550 cases, 343 have already been rehabilitated and their cases have been closed.

Nine of the 550 had to be closed not rehabilitated and 197 are still active and undergoing training in other services. Of the cases already closed and rehabilitated, 254 were closed on jobs and 64 were closed as farmers and farmworkers.

On the cases already closed the average cost for examination by the physiatrist, physical therapist and training in the use of the prosthesis was $61 per case. The average cost of the prosthesis was $212 and the average total case service cost on all amputees was $498.

Chairman HILL. Are there any questions?

It is most interesting. Thank you, sir.

Miss SWITZER. Dr. Gillette, who is the anchorman of the program in Georgia and an orthopedic surgeon in Georgia is here and I would like to present her to the committee and have her say a few words to you.

Chairman HILL. We are glad to have you, Doctor.

STATEMENT OF DR. HARRIET E. GILLETTE, DIRECTOR, PHYSICAL MEDICINE AND REHABILITATION CLINIC, ATLANTA, GA.

Dr. GILLETTE. Miss Switzer, Miss Rogers, and gentlemen. Three days ago down in Atlanta I was privileged to be present at the beginning of the birth of a rehabilitation process.

A. S. Sanders is a 38-year-old colored woman, a mother of 7 children, whose years range from 3 years to 13 years.

On the 23d of September, last year, she was operating a power saw with her husband. The blade flew off and it amputated her left arm just above the wrist and her right arm at the shoulder and her entire right breast.

The vocational counselor sent word to us that since the accident she had not cried. She had not spoken a word, with the exception of asking for her immediate body needs and remained almost stone-like sitting in the corner of her little shack down in south Georgia.

As she came into the room it appeared that she was indeed almost mute. She kept her eyes on the ground and she had no facial expression and she moved with marked rigidity and guided by her aged mother.

As her amputation sites were examined she kept her eyes motionless on the ground and she made no sound and no evidence of recognition of her environment.

It just so happened that on the same day, Mr. Edwards, a 47-year-old white man who had lost his arms 25 years ago was presented for final checkout and discharge. He had also lost his arms—his left one just above the wrist and his right one at the shoulder. That was 25 years ago and for 24½ years his wife has spent her entire time taking care of his bodily needs. Mr. Edwards managed his dairy farm and he could write a little bit by holding a pencil between his teeth, but he was completely dependent upon the services of his wife and his hired help to maintain his household.

Five months before, he had been fitted with prosthesis and had been given a few weeks of training and sent home for practice and for building up of confidence. He came back 3 days ago for his discharge.

We saw we were going to need more help than the team had to offer with our first patient. Mr. Edwards' services were inducted into the team services. He was told the story of her accident and of her subsequent behavior. He came into the clinic room where she was sitting with her old mother and he said, "Now, girl, the first thing you have got to learn is to keep your chin up." The patient still kept her chin down and didn't look. We asked Mr. Edwards to go through a few of the skills that he had learned and he demonstrated very nicely with a good bit of prosthetic dexterity.

Pretty soon they asked him to take his shirt off without help and she looked at his prosthesis and she shuddered. We then asked Mr. Edwards to tell some of the things he did during the day and he described how he got up at 5 o'clock in the morning and how his chores started at that time and how he went about his dairy farm, and the various activities he now had to do because he had been able to let some of his hired help go.

Essie Mae started moving her eyes a little bit. We started asking him questions. Did he think that if he had a little training that he could learn to wash dishes and make beds and sweep and maybe could he tie a pigtail up with a hairbow?

At this point, tears started dropping down Essie Mae's cheeks. She got off the table and went around the corner and stood there like a little schoolgirl and with great big sobs that came from away down in her heart.

She stayed in the corner and cried a little and we finished Mr. Edward's checkout and he performed a very good mechanical functional efficiency. Pretty soon, the sobs stopped and Esther Mae came out of the corner and her chin was up and she said, "Mister, how long is it going to take me to use mine?"

We, down in Georgia, are very proud of the figures Mr. Segars has presented to you today. It takes a great deal of time and effort on the part of doctor and therapist and the prosthetist and the vocational counselor. It also takes a lot of effort on the part of the taxi driver and the orderly and the hometown ministers and the schoolteacher. We are all working together toward one common objective. That is of rehabilitating the patient insofar as it is within our power.

We know that we are charged with the spending of moneys, maintaining the very highest standards that are possible. We also know that we are charged with spending those moneys as economically as possible. After figures have been compiled of the time necessary both before and after the limb and arm and leg schools, we have found that it is the time and training which have been reduced by almost one-half from before school to after with the results at least 3 to 4 times as good or better.

We anticipate that as the team gets more experience and as the counsel program develops, we are going to raise our standards still higher and reduce our training time still further.

We are most grateful, all us citizens in Georgia, for the number of handicapped people who have been given jobs. We all thank you for your attention and I turn the microphone back to General Strong.

Chairman Hill. We certainly thank you for your presentation.

General Strong. Thank you.

Chairman HILL. Doctor, may I say, as Miss Switzer takes her seat, that in my opening remarks this morning I referred to Public Law 565, 83d Congress. That law was passed in 1954. Miss Switzer referred to the fact that she has been able to double the program since the passage of that law. There were amendments to the basic Vocational Education Act. I think I should say that the chairman of the Subcommittee on Health of this committee at the time that law was passed was our good colleague, Senator Purtell, from Connecticut.

I was a member of the subcommittee and I know that the devotion and leadership that he gave in the passage of that legislation was very important. The story that we have witnessed this morning should certainly be very gratifying to him.

Senator PURTELL. Thank you very much, Mr. Chairman.

It has been gratifying.

General STRONG. Mr. Chairman, I think that is the end of the demonstration. I should like to stress once more the importance of the work that is being done in the field. We feel that we are somewhat organized in research and development and this has been a very difficult thing.

We have been working at this for 10 years. When I came into the program, I found 15 contracts scattered around but most of those contracts have dropped by the wayside. We had 1 with the IBM and we had 1 with Goodyear and I have been in close touch with Vickers, and so forth, and I find that the large corporations are too busy to get down to the details that are required in things like this.

So we have found what I call the hard core of this program in devoted individuals here and there who are willing to give of their time and energy to this matter. I think of the Army Prosthetic Research Laboratory and Colonel Fletcher, Dr. Canty of the Navy is here and Dr. Taylor of UCLA and if I start mentioning the others I will take up all of your time.

But these are the people that make this program possible. I am supposed to know something about organization and I have developed with the help of these people, transition procedures. I would not want to bore you with them. But we start with phase 1, with the idea, and we put it into phase 2 for development then and into phase 3 for manufacture and finally into phase 4 and that is where Miss Switzer comes in.

She is getting it into the field. That means that we have to get it into the limb shop because if the prosthetics do not know about these things, and do not manufacture them right, nobody will get them and no veteran or anybody else will have the advantage of all of this research. We feel that it has been a great step forward to have interested the orthopedic surgeons and the physical medicine people, but above all to have these people in the field, the counselors understand about this.

So that next year, in these two schools that we have started, one at UCLA and one at New York University and a third one is to be started in Chicago at Northwestern University, we feel that if we can get these counselors from the field like Mr. Segars and others to come to these short training courses, they will carry the word back into the hinterland.

I just hope and I know this has got to go on, and I look at Mrs. Rogers and I think she started it and I know you gentlemen are going to help to carry it on. Again, I want to thank you on behalf of all of us for this opportunity.

Chairman HILL. General, we thank you.

As you well said, it is not possible to call the names of all of those in this room today who have made their contribution. I notice one sitting back very modestly in the rear of the room, a renowned orthopedic surgeon who, as Medical Director of the Veterans' Administration, did so much to promote this program, our friend Dr. Paul B. Magnuson. [Applause.]

General STRONG. I see Tracy Voorhees sitting over here, and without Trace I do not think that you would have kept going either. [Applause.]

Chairman HILL. That is very good. Will you stand up?

General STRONG. And you all know Bob Allen and he is the most important of all. [Applause.]

Chairman HILL. General, I was about to say that I thought this committee owed its special thanks to Bob Allen who did so much to inspire and arrange this meeting here this morning. I only wish it were possible, and I know I express the sentiments of all the members of this committee in saying that we wish it were possible, for us to adequately thank and express our gratitude and appreciation to you who have come here this morning and given us this demonstration.

I think it ought to be emphasized that many of you have come from great distances, from California and from Michigan and from Connecticut and from New York and from New Jersey, and those of your friends here from Maryland and Virginia, and then from down South in Georgia.

We so much appreciate the parents who have come here today with their fine and lovely young children. We are deeply grateful to all of you.

May I say this has been a wonderful demonstration, so informative and so interesting, and I think perhaps most of all so challenging, that out of these demonstrations must come the resolve and determination that this great program must and shall go forward. We thank all of you. [Applause.]

General STRONG. If anyone wishes to stay and see some of these devices, they will be on two tables here and some of our amputees will be here to demonstrate them.

(Whereupon, at 11:45 a. m., the meeting was adjourned.)

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